

REMARKS

Status of the Claims

Claims 1-9, 11-13 and 15-23 are presented for examination, the independent claims being claims 1 and 21. By this Amendment, claims 1, 11, 13 and 21 are amended.

Summary of the Official Action

In the Official Action, claims 1-9, 11-13 and 15-23 were rejected under 35 U.S.C. 112, first paragraph, as not enabled.

Reconsideration and withdrawal of the rejection respectfully are requested in view of the above amendments and the following remarks.

Formal Amendments to the Claims

The formal rejection of the claims respectfully is traversed. Nevertheless, without conceding the propriety of the rejection, claims 1, 11, 13 and 21 have been amended to improve their form, with particular attention to the Examiner's comments. Support for the proposed amendments may be found in the original application. No new matter has been added. Moreover, Applicants submit that the proposed amendments do not narrow the scope of the claims.

Response to Formal Rejection

Applicants submit that the claimed invention is enabled by the original application, and that the pending claims satisfy all requirements under 35 U.S.C. 112.

The present invention relates to a novel method of calibrating video and an image sensor for use with a document scanner including digital hardware that calibrates at least one of pixel offset and pixel gain of a video signal. In one aspect, as recited in exemplary claim 1, the claimed invention relates to a method comprising calibrating at least one of pixel offset and pixel gain of a video signal; calibrating for pixel gain a video signal input for a video channel provided with an automatic gain control tab by sensing the video signal input for the

video channel provided with the automatic gain control tab to determine a value for calibration; and calibrating for pixel gain a video signal input for a video channel not provided with the automatic gain control tab by multiplying the video signal input for the video signal for the video channel not provided with the automatic gain control tab with a video signal output error value from an integrator, where the video signal output error compensates for pixel error for both the video signal for the video channel provided with the automatic gain control tab and the video signal for the video channel not provided with the automatic gain control tab.

In the Official Action, the Examiner states that "Based on the recited claim language, it appears that the claims are at least directed towards figures 1 and 3 of the present application; however, Applicant has failed to enable one with ordinary skill in the art to apply the disclosure of figure 3 with regard to the disclosure of figure 1." Specifically, the Examiner further states "The respective detailed descriptions of figures 1 and 3 have failed [to] show how the uncalibrated video input (1000) to the system (100) in figure 1 becomes two video channel inputs (with a tab and without a tab) to the process (400) in figure 3 and how the two video channel inputs (with a tab and without a tab) of the process (400) in figure 3 becomes the video input (1300) to the process (500) in figure 4. Additionally, the detailed description of figure 3 has failed to show how the 'automatic gain control tab setpoint' is established or how a 'tab' yields a video channel input with an 'automatic gain control tab' and a video channel input without an 'automatic gain control tab.'" Finally, the Examiner states that "white tab", a "tab cover" and "automatic gain control tab" are terms that are not known or enabling to one with ordinary skill in the art.

Applicants respectfully disagree with the Examiner's position. Nevertheless, without conceding the propriety thereof, Applicants have amended claims 1 and 21 to clarify the

language and to use language that more directly corresponds to the language used in the written disclosure, e.g., at page 6, line 7 to page 7, line 9.

Applicants submit that those skilled in the art readily will be able to make and use the claimed invention based on the written disclosure and the corresponding figures of the drawings.

As disclosed in the Brief Description of the Drawings, Fig. 1 is a block diagram illustrating an exemplary calibration system (100), and Fig. 3 is a block diagram illustrating an exemplary embodiment of an automatic gain control process (400).

As shown in Fig. 1, and as discussed in greater detail in the corresponding written disclosure, in the process flow of the calibration system (100), uncalibrated video (1000) is input to an offset range adjust process section (200); the offset range adjust process section (200) outputs processed video 1100 to a pixel offset process section (300); the pixel offset process section (300) outputs processed video 1200 to an automatic gain (AGC) control section (400); the automatic gain control section (400) outputs processed video 1300 to a pixel gain process section (500); and the pixel gain process section (500) outputs calibrated video 1400.

As disclosed at page 1, lines 29-30, in one exemplary embodiment, an exemplary image sensor (e.g., a Lakes FWA CMOS image sensor) can include multiple channels to transfer images at high scan speed. Thus, Applicants submit that those skilled in the art readily will understand how to provide such an image sensor having multiple channels to transfer video images at high scan speed, and how to process such multiple channels, both individually and collectively. Specifically, Applicants submit that those skilled in the art readily will be able to understand how to process multiple channels, individually and collectively, through the process flow of the calibration system (100) of fig. 1.

Regarding the automatic gain control process section (400), as stated at page 6, lines 20, et seq., the automatic gain control process 400 is performed differently for the video signal for the video channel provided with the automatic gain control tab versus video signals for the other video channels not provided with the gain control tab. For the video channel provided with the automatic gain control tab, as shown in the upper path of fig. 3, video signal 1200 provided by the pixel offset process 300 and corresponding to a channel provided with an automatic gain control tab first enters a multiplier 410, where the video 1200 is multiplied with the result of a (later described) process, in order to provide video signal 1300 output for the channel provided with the automatic gain control tab; the process includes subtracting the video signal 1200 corresponding to the channel provided with the automatic gain control tab from an automatic gain control tab setpoint at subtraction block 410 to determine an error therebetween, accumulating the error in an integrator, and then multiplying the error value with the video input corresponding to the channel provided with the automatic gain control tab in an iterative process. The output of the integrator 430 also is provided to video signals 1200 for the other video channels not provided with the automatic gain control tab at multiplier 440, to obtain video signal output 1300 for those channels not provided with the automatic gain control tab, as shown in the lower path of fig. 3. Applicants submit that those skilled in the art readily will understand this differential processing of video signals for channels provided with, and not provided with, an automatic gain control tab.

The output video signal 1300 from each of these channels then is provided to the pixel gain process section (500), as noted above with respect to fig. 1. Applicants submit that those skilled in the art readily will understand how video signal 1300 for multiple channels, including channels provided with, and not provided with, an automatic gain control tab, may be processed individually and collectively through pixel gain process section 500.

For the above reasons, Applicants submit that those skilled in the art readily will understand how to make and use the claimed invention based on a plain reading of the original application, including in particular figs. 1 and 3 and the corresponding written disclosure.

Conclusion

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submit that the application is in condition for allowance. Favorable consideration of the claims and passage to issue of the subject application earnestly are solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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